EFFECTIVENESS OF COGNITIVE BEHAVIORAL THERAPY INTERVENTION IN THE REDUCTION OF STRESS AMONG DIABETICS

A PROJECT WORK SUBMITTED IN PARTIAL FULFILLMENT

OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF OCCUPATIONAL THERAPY

Submitted By

Reg No. 41091204

JKK MUNIRAJA MEDICAL RESEARCH FOUNDATION

COLLEGE OF OCCUPATIONAL THERAPY

KOMARAPALAYAM – 638 183

Affiliated by

THE TAMILNADU DR.M.G.R.MEDICAL UNIVERSITY

CHENNAI – 600 032

MARCH - 2011

EFFECTIVENESS OF COGNITIVE BEHAVIORAL THERAPY INTERVENTION IN THE REDUCTION OF STRESS AMONG DIABETICS

A PROJECT WORK SUBMITTED IN PARTIAL FULFILLMENT

OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF OCCUPATIONAL THERAPY

Submitted By

Reg No. 41091206

JKK MUNIRAJA MEDICAL RESEARCH FOUNDATION

COLLEGE OF OCCUPATIONAL THERAPY KOMARAPALAYAM – 638 183

Affiliated by

THE TAMILNADU DR.M.G.R.MEDICAL UNIVERSITY

CHENNAI – 600 032

MARCH – 2011

PRINCIPLE **EXTERNAL EXAMINER**

GUIDE **INTERNAL EXAMINER**

CERTIFICATE

This is to certify that the Project work entitled, "**EFFECTIVENESS OF COGNITIVE BEHAVIORAL THERAPY INTERVENTION IN THE REDUCTION OF STRESS AMONG DIABETICS"** is a bonafide compiled work carried out carried out by **Reg. No. 410911204,** Final year student, College of Occupational Therapy under J.K.K. Munirajah Medical Research Foundation, Komarapalaym - 638 183, in partial fulfillment for the award of Degree of **"Master of Occupational Therapy"** of **The Tamilnadu Dr. M.G.R. Medical University, Chennai-32.** This work was done under my supervision and guidance

Mr.M.SARAVANA ROENTGEN MANI, M.I.Th.,
PRINCIPAL
M.Sc. (OT), PGDR. (OT)
J.K.K. Munirajah Medical Research Foundation,
Komarapalaym

ACKNOWLEDGEMENT

My Grace is sufficient to you. II.Cori .12:9

First and foremost I praise the Almighty God for his grace and abundant blessing he has showered upon me and his invisible presence and guidance, throughout the complete course of my project study.

I extend my thanks to **Dr. J.K.K. MUNIRAJAHH, M.Tech., (Bolton),** Chairman, JKKMMRF College of Occupational Therapy for providing me with adequate facilities required for the completion of my course.

I am thankful to **Mr.SARAVANA ROENTGEN MANI, M.O.Th., Principal,** JKKMMRF College of Occupational Therapy for his valuable suggestion for the successful completion of this dissertation.

I am thankful to Guide **Mr._____,** Assistant Professor, JKKMMRF College of Occupational Therapy for his valuable guidance, suggestion and concern at every single state for the successful completion of this dissertation.

I express my thanks to **Dr.DEVA PRASATH JEYASEKHARAN,** Managing Director, Dr. Jeyasekharan Hospital & Nursing Home, Nagercoil Kanyakumari District, allow me to assess and treat Diabetic patients in his hospital.

I must express my sincere thanks to **Mr. DHANAPAL,** Statistician for his valuable help he offered in statistical analysis.

I express my thanks to **Dr. SATHEESH S. VINCENT,** for valuable referrals and encourgement for the completion of the study.

I extend my thanks to **LIBRARIANS**, JKKMMRF College of Occupational Therapy for their help.

I express my heartful thanks to my beloved family members and friends for their love, affection, and encouragement, constant inspiration, prayers and blessing without which I could not have accomplish anything.

I express my hearty thanks to **Mr.V.MOHANRAJ & TEAM, M-Tech Computer Centre**, for their active participation with out who on this study would not have been possible.

Reg.No. 41091204

TABLE OF CONTENTS

ABSTRACT

AIM :

The purpose of this study was to determine the effectiveness of cognitive behavioral therapy intervention in the reduction of stress among diabetics.

METHODS :

Totally 60 subjects (30 in experimental group, 30 in control group) were taken for study with diabetes. Experimental group underwent cognitive behavioral therapy. paired ‘t’ test and unpaired ‘t’ test gave us the effective results.

RESULTS :

The results shows that statistical significance in experimental group than control group with regard to effectiveness of cognitive behavioral therapy.

CONCLUSION :

Cognitive behavioral therapy has an significant and effective tool to reduce stress among diabetes.

KEYWORDS :

Diabetes, stress, cognitive behavioral therapy.

INTRODUCTION

Diabetes mellitus has reached epidemic proportions worldwide as we enter the new millennium. The World Health Organization (WHO) has commented there is "an apparent epidemic of diabetes which is strongly related to lifestyle and economic change". Over the next decade the projected number will exceed 200 million. Diabetes and all are at risk of the development of complications. In India, information on cause of death due to diabetes is available from some retrospective hospital based studies. Zargar, AH et al., (1999) have reported infectious as major cause of death in diabetics followed by renal failure, coronary artery disease cerebrovascular disease and others in that order.

The prevalence of diabetes for all age-groups world wide was estimated to be 2.8% in 2000 and 4.4% in 2030. The total number of people with diabetes is projected to use from 171 million in 2000 to 366 million in 2030. The prevalence of diabetes is higher in men than women, but there are more women with diabetes than men. The urban population in developing countries is projected to double between 2000 and 2030. The most important demographic change to diabetes prevalence across the world appears to be the increase in the proportion of people 65 years of age.

Depression is not generally listed as a complication of diabetes. However, it can be one of the most common and dangerous complications. The rate of depression in diabetics is much higher than in the general population. Diabetics with major depression have a very high rate of recurrent depressive episodes within the following five years. (Lustman et al., 1977).

Diabetic adolescents had a higher incidence of suicidal ideation than expected. Those with suicidal ideation took poorer care of themselves. Not living in a two-parent home was associated with poorer long-term diabetes control. (Goldston, et al., 1997). Depression, anxiety and stress can also cause large jumps in blood glucose levels. Panic attacks may resemble hypoglycemic episodes and vice-versa. People respond differently to stressful situations. Given the same subjective level of stress, one diabetic may have a different glucose response from another. Because of this, one should monitor blood glucose more frequently during periods of stress.

The combination of Cognitive behavioural therapy (CBT) and supportive diabetes education is an effective nonpharmacologic treatment for major depression in patients with diabetes. It may also be associated with improved glycemic control. Therapist is able to plan individualized programs in order to maintain good blood glucose control and achieve optimal weight. Effective counseling ensures both / cardio respiratory and musculoskeletal fitness. This helps people with diabetes improve their quality of life (QOL) and contributes to overall control of blood glucose. The use of alternative therapies, such as yoga can contribute to the achievement of optimal cardio-respiratory health. (Sanjay Kalra, Naresh Kumar, 2007).

AIMS & OBJECTIVES

AIMS

To determine the effectiveness of cognitive behavioral therapy in reduction of stress among diabetes.

OBJECTIVES

1. To evaluate the depression, anxiety and stress levels of both experimental and control groups.
2. To intervene the experimental group with effective cognitive behavioral therapy modalities.
3. To find out the differences between pre and post depression, anxiety and stress levels for both experimental and control groups.
4. To compare the effect of cognitive behavioral therapy between male and female diabetes.

HYPOTHESIS

ALTERNATIVE HYPOTHESIS

There will be significant differences in depression, Anxiety and stress among experimental group after cognitive behavioral therapy.

NULL HYPOTHESIS

There will be no significant differences in depression, anxiety and stress among control group.

REVIEW OF LITERATURE

Laura Shea and Michele (May-2009) expressed, Depression aggravates the risk for diabetes complications, contributing to increased rates of disability and early death. She concluded mental health professionals should be involved in diabetic care and all people with this condition should be screened for depression.

Cathy Lloyd (Mar-2008), described the effectiveness of available tools for detecting depression with diabetes. Its also thought that depression increases the risk of developing type 2 diabetes, the most recent research on diabetes and depression indicates that having both these conditions increases the risk of developing diabetic complications such as stroke heart attack etc. Depression can also have a significant effect on blood glucose control, diabetes self management and overall quality of life (QOL). People with diabetic and depression are also more likely to die at an early age.

Peter J. Norton, (Sep- 2007). Examined the growing cross-cultural awareness has led researchers to examine frequently used research instruments and assessment tools in racially diverse populations. The present study was conducted to assess the psychometric characteristics of the 21-item version of the Depression, Anxiety, and stress Scales (DASS-21) among different racial groups. This suggests that, although the items may load similarly on the depression, anxiety and stress constructs, theses constructs may be differentially inter-related across groups.

Sanjay Kalra, et al., (Sep-2007) Stated, therapist are able to plan individualized programs in order to maintain good blood glucose control and achieve optimal weight. Effective counseling ensures both cardio respiratory and musculoskeletal fitness. This helps people with diabetes improve their quality of life (QOL) and contributes to overall control of blood glucose. These alternative therapies, such as yoga can contribute to the achievement of optimal cardio respiratory health.

Annelid sepia, Johnny ludvigsson (Feb-2006) Suggested psychological stress decreases insulin sensitivity and increases insulin resistance and may hence be important in the development onset of type 2 diabetes (T2D). Ten retrospective case control studies were found, nine studies showed a positive association between stress and development onset of T2D.

Yolanda Cate, Shelley Sikes Baker, Mary Pat Gilbert (Oct 2005-AJOT), stated that diabetes affects 5.2% of the population, many of those persons experience loss of vision as one complication of the disease. Occupational therapists are treating these persons, often for other resulting complications (such as stroke or amputations), or are being asked to adapt techniques or equipment (such as insulin - drawing devices) needed for diabetes management. Because no guidelines exist for occupational therapy with persons with diabetes or vision loss or both, occupational therapists may be unsure of appropriate treatment approaches. Among the approaches described in the occupational therapy literature, common ones include collaboration with other professionals and incorporation of one or more aspects of the diabetes regimen into the person's life-style. When addressing persons who have both diabetes and

vision loss, therapists consider their own knowledge base as well as the persons' needs in managing their diabetes.

K. H. McVeigh (2003) Queried to six questions regarding sadness, nervousness and other feelings were the basis for classifying individuals as having serious psychological distress, which the researchers termed SPD. The team found that 9 percent of the participants had diabetes, and 5 percent had SPD, The prevalence of SPD was 10.4 percent among people with diabetes. Even after adjusting for age, gender, ethnicity, marital status and income, the odds of having SPD was 90 percent higher among diabetic subjects, according to an article in the Morbidity and Mortality Weekly Report, published by the Centers for Disease Control and prevention.

J.L.Henry, Wilson (1997) Designed to evaluate the efficacy of a combined cognitive-behavioural stress management programme in improving subjective anxiety and diabetic control in 19 subjects with non-insulin-dependent (NIDDM, Type II) diabetes. Subjects were randomly allocated to either cognitive-behaviour therapy (n = 10) or waiting list (n = 9) conditions. Treatment consisted of six weekly 1.5 - hour sessions conducted in the small groups by one therapist. Treatment consisted of both progressive muscular relaxation training and cognitive coping skills training. Measures, obtained at pre-treatment and post-treatment, included self report scales of anxiety, depression and daily stressors, glycosylated haemoglobin and fasting blood glucose. Results indicated that therapy had significant effects in the amelioration of anxiety and stress.

Jane Case-Smith. EdD, OTR/L, FAOTA stated how stress affects the body has increased among biomedical researchers, healthcare providers, and consumers. Recent research has shown that stress can cause weight gain, health problems, emotional problems, immune system compromise, and relationship strain. Large studies have demonstrated that situations or living conditions that create chronic stress have detrimental effects on health. White and Mulligan provide a systematic review on occupational therapy research using biophysiological measures of the body's response to stress and sensory input. The measures are useful when investigating questions such as why individuals respond differently to sensory stimulation. Which biophysiological profiles enable successful adaptation to stressful events, and which profiles are associated with resiliency to situations of chronic stress.

Mendes DD, et al., reviewed on the effectiveness of cognitive behavioural therapy for posttraumatic stress disorder (PTSD). Cognitive behavioral therapy (CBT) is the most common psychotherapy approach for the treatment of PTSD. Nevertheless, previous reviews on the efficacy of several types of psychotherapy were unable to detect differences between CBT and other psychotherapies. This study was to conduct systematic review on the efficacy of CBT in comparison with studies that used other psychotherapy techniques. Randomized clinical trials published between 1980 and 2005 and that compared CBT with other treatments for PTSD was included. The main outcomes were remission, clinical improvement, dropout rates and changes in symptoms. The 23 clinical trials included in the review comprised 1923 patients: 898 in the treatment group and 1,025 in the control group. CBT had better remission rates than EMDR (RR = 0.35; 95% CI: 0.16; 0.79; p = 0.0 I) or supportive therapies (RR = 0.43; 95% CI: 0.25; 0.74; P = 0.002,

completer analysis). CBT was comparable to Exposure Therapy (ET) (RR = 0.90: 95% CI: 0.58: 1.40: p = 0.64), and cognitive therapy (CT) (RR = 1.0 I: 95% CI: 0.67: 1.5 I: p = 0.98) in terms of efficacy and compliance. These findings suggest that specific therapies, such as CBT, exposure therapy and cognitive therapy are equally effective, and more effective than supportive techniques in the treatment of PTSD.

Delahanty LM, et al., characterized the determinants of diabetes-related emotional distress by treatment modality (diet only, oral medication only, or insulin). A total of 815 primary care patients with Type 2 diabetes completed the Problem Areas in Diabetes (PAID) Scale and other questions. We linked survey data to a diabetes clinical research database and used linear regression models to assess the associations of treatment with PAID score. PAID scores were significantly higher among insulin-treated (24.6) compared with oral-treated (7.8, P < 0.00) or diet-treated patients (4.7, P < 0.00), but not different between oral- vs. diet-treated patients (P = 0.2). Group scores remained similar, but the statistical significance of their differences was reduced and ultimately eliminated after sequential adjustment for diabetes severity. Worrying about the future and guilt/anxiety when off track with diabetes were the top two serious problems (PAID > or= 5) in all treatment groups. Not accepting diabetes diagnosis was a top concern for oral and diet-treated patients and unclear management goals distressed diet-treated patients. Primary care patients treated with insulin reported higher diabetes-related emotional distress compared with oral or diet-treated patients. Greater distress was largely explained by greater disease severity and self-care burdens. To improve diabetes-specific quality of life, clinicians should address patients sense of worry and guilt uncertain acceptance of diabetes diagnosis, and unclear treatment goals.

K Nieuwenhuijsen, et al., used the depression Anxiety Stress Scales (DASS) and detected anxiety disorder and depression in employees absent from work because of mental health problems and to evaluate the psychometric properties and examine the ability to detect cases with anxiety disorder and depression in a population of employees absent from work because of mental health problems and the Internal consistency. Construct validity and criterion validity of the Depression Anxiety Stress Scales (DASS) were assessed. furthermore, the ability to identity anxiety disorders or depression was evaluated by calculating posterior probabilities of these disorders following positive and negative test results for different cut off scores. The psychometric properties of the DASS are suitable for use in health care setting. The DASS can be helpful in ruling out anxiety disorder and depression in employees with mental health problems.

Cuijpers P. Riagg, et al., analysed several therapies for unipolar depression have been developed, for example cognitive therapy, behavior therapy and pharmacotherapy. A new kind of therapy is bibliotherapy. What is new in this treatment modality is not the content, because bibliotherapy usually uses a cognitive-behavioral approach. Only the form in which it is presented is new. In bibliotherapy the patient takes a standardized treatment home, in book form, and works it through more or less independently. Contacts with therapists are only supportive or facilitative. No traditional relationship between therapist and patient is developed.

Angela C. Register, et al., examined 120 students with a phone-contact condition and a no contact, stress-inoculation bibliotherapy condition were compared with a phone-contact, wait-list control

condition and a no contact, wait-list control condition. Results indicated that the two experimental conditions were superior to the control conditions in reducing subjective anxiety and that the phone-contact and no-contact conditions were non differentially efficacious in treatment adherence or gains. Treatment did not result in significant increases in academic performance. Treatment gains were maintained at a 1-month follow-up. The implications of bibliotherapy for test anxiety as an alternative or adjunct to traditional treatments.

Kim Harper, et al., expressed in randomized control trial (RCT) Cognitive Behaviour Therapy for Depression in Type 2 Diabetes Mellitus, psychotherapy is the principal nonpharmacologic method for the management of depression, but its usefulness for depressed patients with diabetes remains unknown. To assess the efficacy of cognitive behavior therapy (CBT) for depression in patients with diabetes. 51 patients with type 2 diabetes and major depression. Patients were assigned either to a group that received 10 weeks of individual CBT or to a control group that received no specific antidepressant treatment. All patients participated in a diabetes education program to control for the effects of supportive attention and the possible influence of enhanced diabetes control on mood. Degree of depression was measured by using the Beck Depression Inventory; glycemic control was measured by using glycosylated hemoglobin levels. Outcomes were assessed immediately after treatment and 6 months after treatment. The combination of CBT and supportive diabetes education is an effective non pharmacologic treatment for major depression in patients with type 2 diabetes. It may also be associated with improved glycemic control.

RELATED LITERATURE

Diabetes is a disorder of metabolism the way our bodies use digested food for energy. Most of the food we eat is broken down into glucose, the form of sugar in the blood. Glucose is the body's main source of fuel.

After digestion, glucose enters the blood stream. The glucose goes to cells throughout the body where it is used for energy. However, a harmone called insulin must be present to allow glucose to enter the cells. Insulin is hormone produced by pancreas, a large gland behind the stomach.

In people who do not have diabetes the pancreas automatically produces the right amount of insulin to move glucose from blood in to cells. However, diabetes develops when the pancreas does not make enough insulin or the cells in the muscles, liver and fat do not use insulin properly, a both as a result , the amount of glucose in the blood increases white cells are starved of energy.

Overtime, high blood glucose levels damage nerves and blood vessels, leading to complications such as heart disease and stroke, the leading causes of death among people with diabetes and lead to vision loss, kidney failure, and amputations.

Diabetes causes severe morbidity. Complications of diabetes can be divided into three categories.

- Metabolic complications of low blood glucose levels (hypoglycemia) and of high blood glucose levels. (hyperglycemia). Diabetic coma is one such metabolic complication of a particular severe nature.

- Damage to small blood vessels (microvascular complications) leading in turn to damage to the retina (retinopathy) kidney (nephropathy) and nerves (Neuropathy).

- Damage to the larger arteries leading to the brain (leading to stroke) or to the heart (leading to coronary heart disease) or to the legs and feet (leading to peripheral vascular disease) (macrovascular complications).

The UK Prospective Diabetes study (UKPDS) a multi-centre prospective randomized intervention trial where the subjects were people with newly diagnosed Type 2 diabetes has found that nearly half of the people with diabetes recruited to the trial had one or more micro or macrovascular complication. Diabetes mellitus is often has recorded as cause of death. It leads to other disease conditions, which subsequently become the cause of death. According to the W.H.O study (Murray, Lopez, 1996) there are about five times as many deaths indirectly attributable to diabetes as directly attributable in established market economics.

Diabetes is a risk factor for a number of non-communicable diseases. Odds ratio/risk ratio associated with diabetes as risk factor, stroke, neuropathy, and cataract. This data was used to find population attributable risk due to diabetes for various non-communicable diseases.

GLOBAL PREVALENCE OF DIABETES

The prevalence of diabetes for all age-groups world wide was estimated to be 2.8% in 2000 and 4.4% in 2030. The total number of people with diabetes is projected to use from 171 million in 2000 to 366 million in 2030. The prevalence of diabetes is higher in men than women, but there are more women with diabetes than men. The urban population in developing countries is projected to double between 2000 and 2030. The most important demographic change to diabetes prevalence across the world appears to be the increase in the proportion of people 65 years of age. The number of people with diabetes in increasing due to population growth, aging, urbanization, and increasing prevalence of obesity and physical inactivity. Quantifying the prevalence of diabetes and the number of people affected by diabetes, now and it the future is important to allow rational planning and allocation of resources. Estimates of current and future diabetes prevalence and epidemiological data have become available for several countries in Africa and the Middle East and for India.

This report provides estimates of the global prevalence of diabetes in the year 2000 (as used in the World Health organization [WHO] Global Burden of disease study and projections for 2030. It provides a sequele to the report describing estimates of the global burden of diabetes. As before, the estimates are based on demographic changes

alone with the conservative assumption that other risk factor levels such as obesity and physical activity remain constant (in developed countries) or are accounted for by urbanization (in less developed countries). The current estimates include all age-groups and as most data sources do not distinguish between type 1 and type 2 diabetes in adults, it is not possible to present data separately for subtypes of diabetes.

STRESS

Stress as the reaction of people's mind and bodies to demands placed upon them. It is feeling of tension, anxiety or worry, as when we might say, 'I'm nervous about the presentation I have to give a next week' or 'I always feel apprehensive and tongue-tied when talking to my doctor'. Its origins lie in studies of physiological responses to stressors, as in Selye's (1978) identification and account of the three-phase General Adaptation Syndrome, as described below.

1. An immediate alarm reaction, itself divided into two sub stages. The first substage (shock) involves a dip in the person's coping effectiveness. The second substage is counter shock-the restitution and enhancement of coping effectiveness as the mobilize resources of the autonomic nervous system begin to have their effect.

2. A resistance stage, where people use a range of coping strategies to combat the response that the stressors have initiated.

3. A stage of exhaustion and collapse that is reached if the demands on the body are overwhelming or unremitting.

DIABETES, DEPRESSION AND STRESS

Depression is not generally listed as a complication of diabetes. However, it can be one of the most common and dangerous complications. The rate of depression in diabetics is much higher than in the general population. Diabetics with major depression have a very high rate of recurrent depressive episodes within the following five years. (Lustman et al., 1977). A depressed person may not have the energy or motivation to maintain good diabetic management. Depression is frequently associated with unhealthy appetite changes. The suicidal diabetic adolescent has constant access to potentially lethal doses of insulin. For over three hundred years, physicians have suspected are interaction between the emotions and the course of diabetes mellitus. Studies have examined whether stressful events or psychiatric illness might precipitate either Type I (insulin-dependent) or type II (Non-insulin dependent) diabetes.

Now that we have more accurate methods of measuring glucose control, it has become easier to measure both short-term and long term effects of emotional factors on blood glucose level. One study found that children judged to have a "Type A" personality structured had an increased blood sugar elevation in response to stress. Children with a calmer disposition had a smaller glucose rise when stressed. (Stabler et al. 1987) a 1997 study suggested that type I patients with a history of a psychiatric illness might be at increased risk for developing diabetic retinopathy. Those patients with a psychiatric history were found to have a higher average glycosylated hemoglobin.(a measure of long term diabetic control) (Cholen et al 1997) Children whose relatives made more critical comments had significantly poorer glucose control. Interestingly

enough, emotional over involvement between family members was not correlated with poor diabetic control. (Koenigsberg et al., 1993). Diabetic adolescents had a higher incidence of suicidal ideation than expected. Those with suicidal ideation took poorer care of themselves. Not living in a two-parent home was associated with poorer long-term diabetes control. (Goldston, et al., 1997).

Recent studies have suggested that effective treatment of depression can improve diabetic control. In a study by Lustman and colleagues, glucose levels were shown to improve as depression lifted. The better the improvement, the better the diabetic control. (Lustman et al., 1997). Being diagnosed with diabetes is a major life stress. It requires a large number of physical and mental accommodations. The individual must learn about a complex system of dietary and medical interventions. Lifestyle, work and school schedules may have to be altered. This can consume a lot of energy for both the individual and his or her family. Just as important, are the psychological adjustments. One must adjust to a new view of oneself. For those who liked to see themselves as invincible, this may be particularly difficult. Many newly diagnosed diabetics go through the typical stages of mourning. These are denial, anger, depression and acceptance.

BODY AND MIND DIMENSIONS OF DIABETES

Diabetes poses a major life stress that requires considerable physical, emotional and psychological accommodation and coping. This heavy burden is related to at least four principal factors.

1. Depression

Depression is a common problem in people with diabetes. The American Diabetes Association recommends routine depression screening for people with diabetes, as well as long-term monitoring for depression screening for people with diabetes, as well as long-term monitoring for depression recurrence in those with a history of depression.

2.Anxiety

In a study on behavior and mental health including > 200,000 adults, Li et al., found that people with diabetes were 20% more likely than those without diabetes to have an anxiety were reported in Hispanies and adults >30 years of age.

3. Stress and social burden

In addition to major issues related to anxiety and depression, diabetes has long been recognized for its potential to interfere with social interactions and relationship. The impact of stress and social burden, sometimes referred to as stigmatization, is considerable, if incompletely understood.

4. Diabetes complications

Over the course of living with diabetes, > 70% of patients will suffer a heart attack or stroke, > 5% experience blindness in one or both eyes, 10% experience amputation of a toe or worse, and 5% must cope

with end-stage renal disease. These and other major complications of diabetes and stress and further increase the risk of depression, anxiety, and stress and poor quality of life.

DEPRESSION, ANXIETY, STRESS SCALE-(DASS)

General description of the scale

The DASS is a set of three self-report scales designed to measure the negative emotional states of depression, anxiety and stress. The DASS was constructed not merely as another set of scales to measure conventionally defined emotional states, but to further the process of defining, understanding, and measure the ubiquitous and clinically significant emotional states usually described as depression, anxiety and stress. The DASS should thus meet the requirements of both researchers and scientist-professional clinicians.

Each of the three DASS scales contains 14 items, divided into subscales of 2-5 items with similar content. The depression scale assesses dysphoria, hopelessness, devaluation of life, self depression, lack of interest/involvement, anhedonia and inertia. The Anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The stress scale is sensitive to levels of chronic non-specific arousal. It assess difficulty relaxing, nervous arousal, and being easily upset/agitated, irritable, over reactive and impatient. Subjects are asked to use 4-point severity/frequency scales to rate the extent to which they have experienced each state over the past week. Scores for depression, Anxiety and stress are calculated by summing the score for the relevant items.

CHARACTERISTICS OF DASS-SCALE

Depression Scale

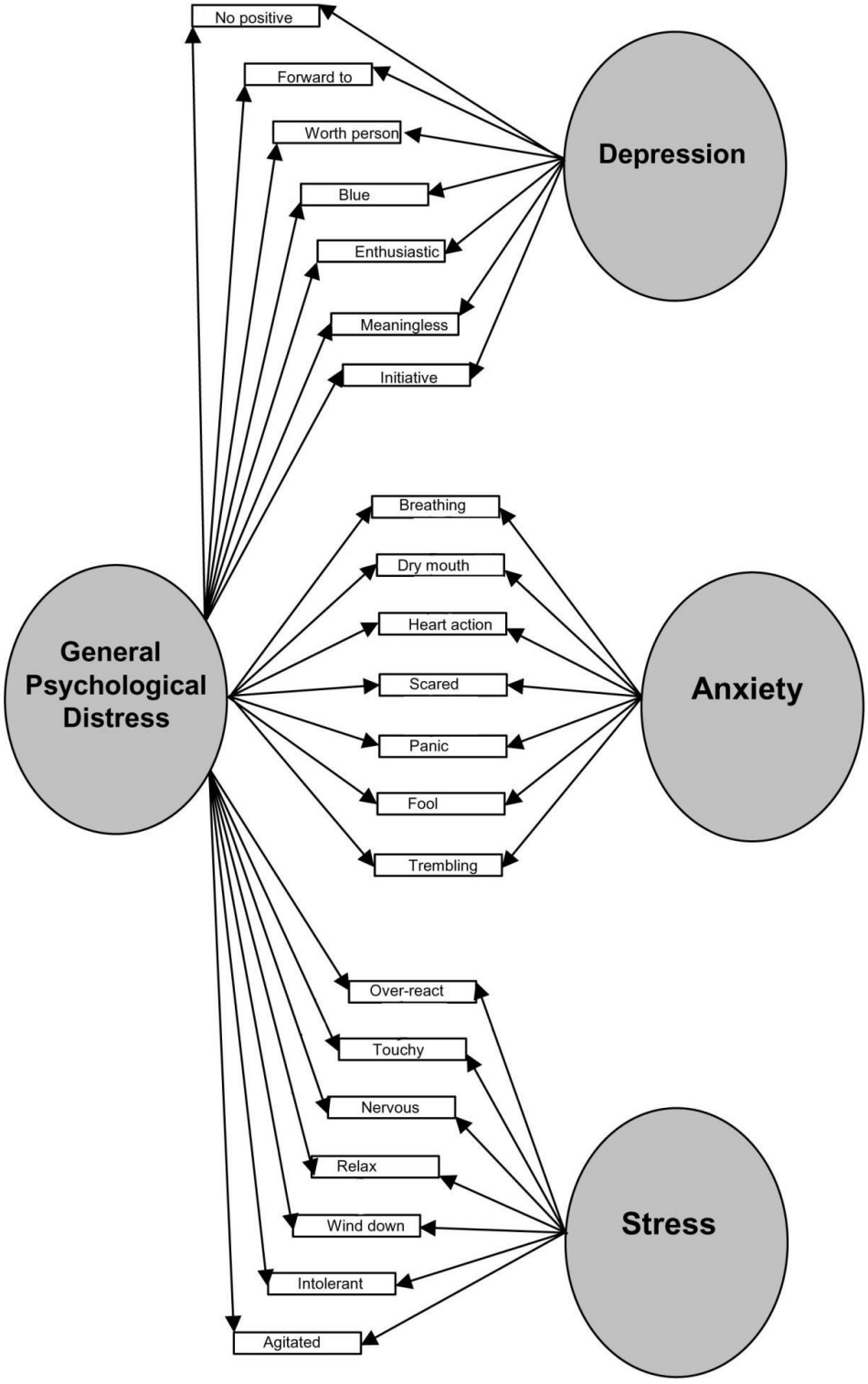
- Self-disparaging
- Dispirited, gloomy, blue
- Convinced that life has no meaning or value.
- Pessimistic about the future.
- Unable to experience enjoyment or satisfaction.
- Unable to become interested or involved.
- Slow, lacking in initiative.

Anxiety Scale

- Appropriate, panicky
- Trembly, shaky
- Aware of dryness of the mouth, breathing difficulties, pounding of the heart sweating of the pains.
- Worried about performance and possible loss of control.

Stress Scale

- Over-aroused tense
- Unable to relax
- Touchy, easily upset
- Irritable
- Nervy, jumpy , fidgety
- Intolerant of interruption or delay



OPTIMAL MODEL OF DASS-21

DASS -21 SEVERITY RATINGS

The DASS is a quantitative measure of distress along the axes of depression, anxiety (Symptoms of psychological arousal) and stress (the more cognitive, subjective symptoms of anxiety). The individual DASS scores do not define appropriate interventions. They should be used in conjunction with all clinical information available to you in determining appropriate treatment for any individual. The DASS 21 item version, multiply the score obtained by 2.

DASS	***Normal***	***Mild***	***Moderate***	***Severe***	***Extremely Severe***
Depression	0-9	10-13	14-20	21-27	28+
Anxiety	0-7	8-9	10-14	15-19	20+
Stress	0-14	15-18	19-25	26-33	34+

COGNITIVE BEHAVIORAL THERAPY

Cognitive behavioral therapy (CBT) is a psychotherapeutic approach that aims to teach the person new skills, on how to solve problems concerning dysfunctional emotions, behavioral and cognitions throught a goal-oriented, systematic procedure (Barker 2003). The title is used in diverse ways to designate behavior therapy, cogntive therapy and to refer to therapy based upon a combination of basic behavioral and cogntive research. Cognitive behavioral therapy (CBT) has been a survival kit for psychotherapy in an era of pressing challenges from bioloical psychiatry. It methodss make sense,it is usually brief, and it has been demonstrated effective in so many controlled trials that it is all but unassailable by critics.

*According to **Bandura's social learning theory**

1. Change a patients thought from incapable to capable (automatic thoughts).
2. Use activities in which he can experience himself as capable and Increasing the patients perceptions of himself as capable.
3. Use "Verbal techniques" to help the patient identify his own success, genealize his learning and increasing his sense of self control and competence.

*According to **Ellis rational emotive theory**

1. Disputing irrational beliefs
2. Assign cognitive home work
3. Bibliotherapy.
4. Employing new self statements.

*Accordig to **Becks cognitive theory**

1. Identifying thoughts and testing them against reality.
2. Identifying and changing information processing errors.
3. Identifying dysfunctional assumptions and beliefs which increase vulnerability to emotional disorder & reconstructing more adaptive schemata.

COGNITIVE BEHAVIORAL THERAPY AND DIABETES

People with diabetes have roughly twice the risk of depression affects some 15% to 30% of individuals with diabetes at any given time. Depresion in turn may worsen diabetes control, since the depresed person is less likely to stay active and to take all the steps necessary to ensure good blood glucose.

As peron with diabetes might react to a very high blood glucose reading by thinking “Another bad blood glucose reading. Why can’t ever keep my blood sugar under control? I’m a failure!” This person would be engaging in magnification, overgeneralization, and all-or nothing thinking by overemphazing the importance of one blood glucose reading, deciding that it sums up his blood glucose control in general, and deciding that it reflects a life time of incompetence. This type of thinking not only wreaks havoc on self-esteem, but it also undermines a person’s motivation to control his diabtes.

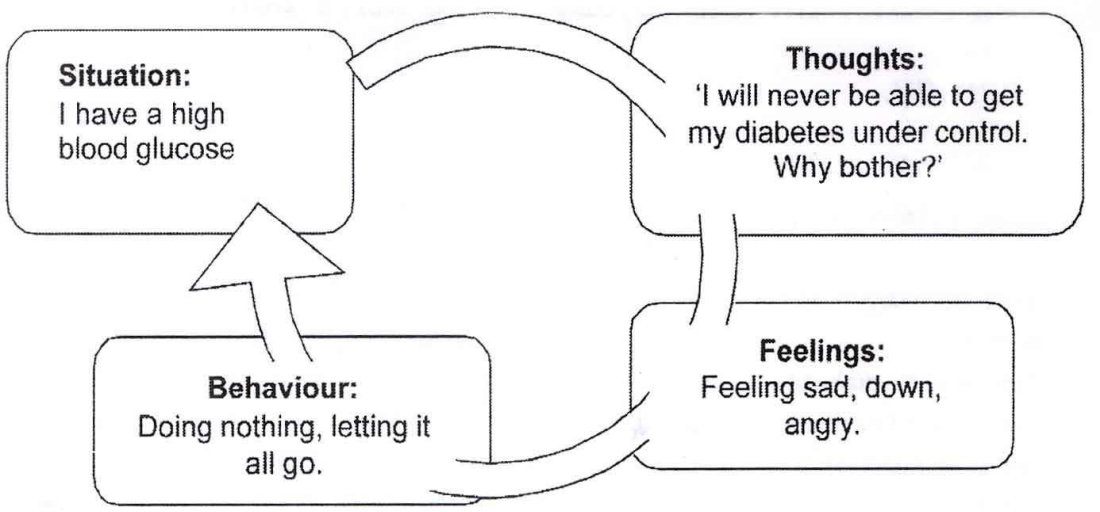
People with diabetes have to face the challenge of carrying out a range of self-care tasks on a day-to-day basis without compromising a ‘normal’ flexible lifestyle and their sense of people with diabetes find that trying hard does not always pay off (Rubin et al., 1990). Additionally, the health benefits resulting from the daily efforts to control diabetes often remain invisible in the short term. There is no immediate positive feedback, other than the stated reassurence that strick glycaemic control now can help to reduce health risks in the future. The lack of direct feedback, jeopardizes the maintenance of intensive diabetes self management in the long run. Diabetes is for life but not surprisingly, many people with diabetes find it hard to stick to the treatment regimen all the time.

Beliefs and negative emotions

Given that diabetes is highly demanding both for people with condition and their families, it’s not surprising to see that a sustantial number of people repeatedly fail to keep it under control. Particularly from those who perceive good diabetes control as an important goal, this

'failure' can give rise to feeling of guilt, frustration, anger these negative feelings, resulting from multiple experience of 'failure' foster a pessimistic attitude towards diabetes and onself, leading to a tendency of 'letting it all go, instead or renewing the efforts. The reinforces a negative cycle of events that can ultimately lead to a state of emotional exhaustion, defined as diabetes burnout by Polonsky (2000). Unfortunately, this emotional state will further reinforce poor self-management and control, resulting in even more negative feelings.

The Negative Cycle Leading To Poor Diabetes Management



A more effective way of dealing with undesirable emotions and behavioral can be found in Cogntive Behavioral Therapy (CBT). This notion has be found in the works of both Aaron Beck, the founder of CBT, and his contemporary Albert Ellis, the organzatior of Rational Emotive Therapy (RET). Originating in the sixties, both. Applied to diabetes, this means that coping with the daily demands of the condition is difficult, but this does not necessarily imply that one needs to suffer from these damands. Much depends on the individual's percerption and attitude.

The A.B.C.D.E Scheme of diabetes

A. Acting event: I have a high blood glucose reading'

B. Belief: (What did you think/tell yourself ?): I will never be able to get my diabetes under contol. I'm such a failure. It's no use bothering anymore.

C. Consequnence : (What did you feel ? What did you/didn't you do?). Feeling sad, down, angry at a myself. Guilty. Did nothing, avoided checking my blood glucose

D. Discussion: (Is it helpful or unhelpful, and in what ways?) Will it help me reach my goals? Does it create emotions I can handle? Does it lead me to act in harmful way? Does it contain. Misinterpretations, catastrophizing, demands, or negative self-ratings.

E. Effect: (How would you like to feel? What would you ideally do?): Feeling said, down, angry at myself, Guilt. Did nothing, avoided checking my blood glucose. Feeling less and sad depressed. Keep on checking my blood glucose without feeling so guilty.

COGNITIVE BEHAVIORAL TECHNIQUES ON DIABETES TO REDUCE STRESS

- Bibliotherapy
- Diversion (Relaxation)
- Home work
- Activity scheduling

Bibliotherapy

Bibliotherapy or reading therapy is a therapy in which person suffering from depression reads self-help books and other motivational books in between therapies to speed up the recovery several controlled clinical trails have shown that bibliotherapy can give results comparable to that of drug therapy or psychotherapy. Furthermore, patients in bibliotherapy recovered faster from depression than those on conventional therapy. They had better outlook on life. Bibliotherapy is also useful as a complementary therapy to speed up the recovery along with conventional therapy.

Bibliotherapy can be adminstered in two ways

1. The therapists can "prescribe" a self-help book for their patients to read between therapy sessions to increase the speed of learning and recovery. (complementary therapy).
2. Individuals suffering from depression or anxiety can be given a self-help book to read as a self-administered treatment (Stand-alone therapy).

First indication of the popular of bibliotherapy came in a survey conducted in 1994, 500 American mental health professionals were asked if they "prescribed" book for patients to read between sessions to speed recovery. Seventy percent of the therapists polled indicated that they did use "bibliotherapy" with their patients, and 86 percent reported that the books were helpful to their patients.

Bibliotherapy can help with

- Promoting personal growth and development
- Development new values and attitudes.
- Understanding of human behavioral and motivations.
- Honest self –appraisal
- Realizing that you are not the only person to encounter such a problem.
- Learning how to stop pessimistic and helpless thinking and start to be optimistic.
- Encouraging to discuss a problem more freely.
- Creating individual plan for constructive course of action.

Diversion (Relaxation-Diaphragmatic breathing)

Relaxation training of various kinds is also part of CBT, especially in the treatment of stress and anxiety disorders. Mindfulness includes training diaphragmatic breathing. This technique influences some biochemical features of psychological state-such as the blood levels of oxygen and carbon dioxide-as well as shifting attention away from distressing thoughts. Some behavioral purist, however, emphasize only extinction of conditioned learning and oppose focusing on the breath because it can readily be used as a distraction from facing anxiety and stress.

Homework

The homework is actually a set of assignments given by therapies to patients. The patient may have to take notes while a session is being

conducted, review the audiotapes of a particular session or he may have to read article / books that are related to the therapy. In occupational therapy, the occupational therapists more frequently assigns tasks than mental or verbal exercises. These homework tasks typically can be accomplished quickly. For example, the client may be asked to make a draft of his or her resume before the next employment-readiness class or to make a list of the geographical areas for findings and the benefits of each area before the next community transition group meeting .

Activity scheduling

Actvity scheduling in defined as the process of deciding how to implement a set of activity choices during a defined time cycle. It entails an interrelated set of decisions made by the individuals, interactivity with other individuals in household activities. The first computational process is scheduler, developed by Garling, et al., (1989). It is primarily a conceptual framework for understanding the process by which individuals organise their activities. Activity scheduling in based on the principle of heuristic search.

METHODOLOGY

RESEARCH DESIGN

The present study was two groups, control & experimental with Pre & Post test, Quasi experimental design.

SETTING

The study was conducted in Dr.Jeyasekharan Multispeciality Hospital, Nagercoil, Kanyakumari District.

SAMPLE SIZE

The sample size consists of 60 patients 30 experimental and 30 control.

SELECTION CRITERIA

- ***Inclusion Criteria***

1. Type II Diabetes patients.
2. Age 40-60
3. Able to read and write in English.
4. Patients with regular medications.

- ***Exclusion Criteria***

1. Patients with Secondary complications.
2. Patients more than 60 age group
3. Patients with irregular medication.
4. Patients unable to read and write in English.

METHOD OF SAMPLE SELECTION

Using convenience sampling research design, 60 patients with diabetes and separated in to experimental and control (No intervention) each 30 patients.

VARIABLES

- ***Dependent Variables***

    - Stress, anxiety & Depression

- ***Independent Variables***

    - Cognitive behavioral therapy.

INSTRUMENT USED

Depression, Anxiety, Stress Scale (Dass-21), Appendix-1

PSYCHOMETRIC PROPERTIES OF DASS -21

Reliability of the DASS -21

The reliabilities (internal consistencies) of the DASS-21 Anxiety, Depression, Stress and total Scale were estimated using Cronbach's alpha, a was 0.88 for the depression scale 0.82 for the anxiety scale 0.90 for stress scale and 0.93 for the total scale.

Validity of the DASS -21

Internal consistency of the DASS subscales was high, with Cronbach's alphas of 0.94, 0.88 and 0.93 for depression, anxiety, and stress respectively. Factor analysis revealed a three factor solution, which correspondence well with the three subscales of the DASS. Construct validity was the DASS with indices of convergent validity (0.65 and 0.75), and lower correlations of the DASS with indices of divergent validity (range 0.22 to 0.07) support for criterion validity was provided by statistically significant difference in DASS scores between two diagnostic groups.

Procedure

- The investigator describes the purpose and procedure of the study to Hospital referred physician.
- Demographic data were obtained.
- The investigator identified prospective participants from the respective hospitals to the inclusion criteria.

- Depression, anxiety, stress scale was administered individually-patient was ask to read each statement and circle a number 0, 1, 2, or 3 which indicates how much the statement applied to your over the past week. There were no right or wrong answers. Do not spend too much time on any statement.
- The investigator solved, who were not understand the correct meaning of DASS-21 English Version without bias. (Within limits).
- The intervention assessments were done on the same group.
- Data's were tabulated and statistical analysis was done.

INTERVENTION

Cognitive-behavioral therapy is an action-oriented from of psychosocial therapy that assumes that maladaptive, or faulty, thinking patterns cause maladaptive behavior and "negative" emotions. The treatment focuses on changing an individual's thought (cognitive patterns) in order to change his or her behavioral and emotional state.

Intervention protocol

Treatment sessions were 45 minutes in duration per day. Patients in the experimental group were seen two times in a week and eight to ten times in one months and it continuous for four months as intervention period. Patients in the control group did not receive any occupational therapy intervention for the duration of the study, but were seen at the end of the study.

ELEMENTS OF COGNITIVE BEHAVIORAL THERAPY

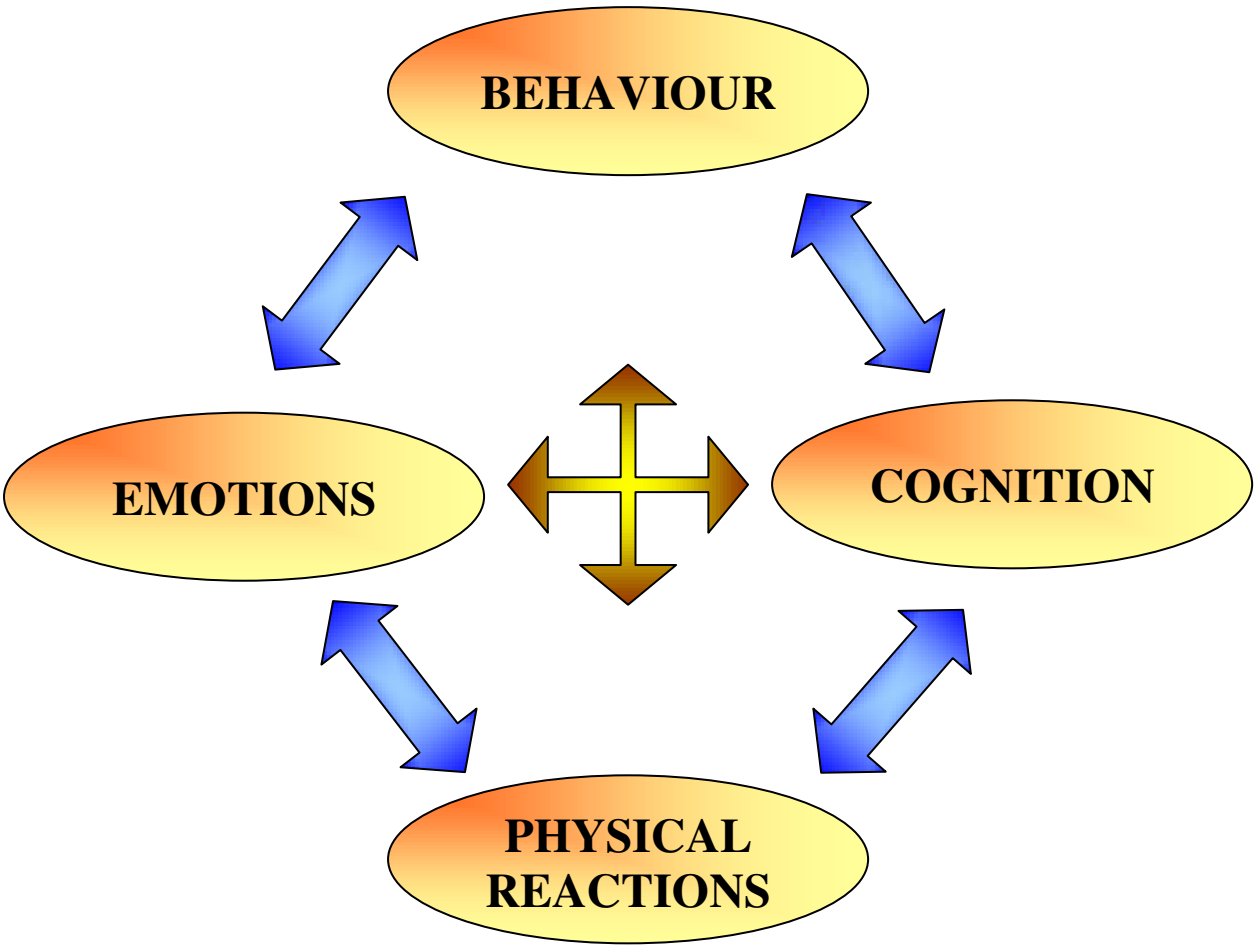
Structuring the therapy session-1

- Establish Trust and Rapport
- Socialize patient into therapy
- Normalize difficulties and instill hope
- Elicit expectations for therapy
- Gather additional information
- Collaboratively develop goal list for therapy.

Structuring the therapy session-2

- Do a mood check (DASS-21)
- Update from previous session
- Set an agenda
- Review Homework
- Discuss agenda items
- Intersperse capsule summaries
- Final summary
- Assign home work
- Feed back

CONCEPTUAL FRAMEWORK OF COGNITION MODEL



CONCEPTUAL FRAMEWORK OF COGNITIVE MODEL

1. The cognitive model is the observation that behaviour and emotions are in constant interaction with cognition.
2. A persons congition or beliefs may be inaccurate leading to excessive emotional reactions and ineffective coping behaviour.
3. Applied to diabetes, this means that coping with the daily demands of the conditon is diffcult, but this does not necessarily imply that one needs to suffer from these demands, much depends on the indivudual perception and attitude.
4. Cogntive behavioral therapy poists that emotional and behavioral problems are rooted in a system of "Core beliefs" that are the product of our upbringing, education and experiecnes in life.
5. These experiences are mainly negative, negative thoughts are "automatically" generated. These thoughts contain some form of cognitive distortion about ourselves and the world surrounding us, resulting in for "Catastrophizing" (when negative consequences are magnified) or "over generalizing" (when a negative event is perceived as a never-ending pattern of defeat.
6. The aim of cognitive behavioral therapy is to help patients modify their emotions and improve coping behavior by assisting them to identify their dysfunctional beliefs, test these beliefs against reality, and replace them with more appropriate (or) realistic beliefs.

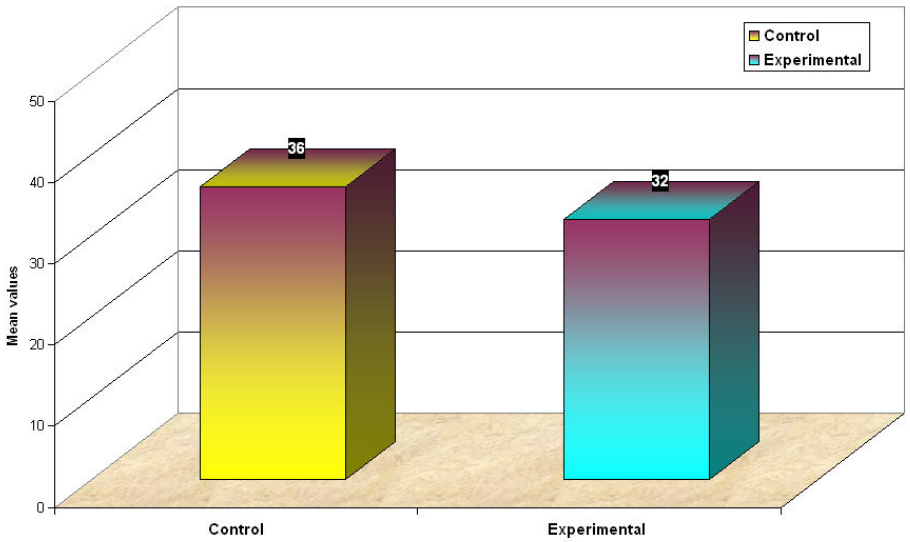
STATISTICAL ANALYSIS

TABLE NO. 1
COMPARISON BETWEEN PRE & PRE TEST AMONG CONTROL AND EXPERIMENTAL GROUP

Table No: 1 (a) Depression

Group	*N*	*Test*	*Factors*	*Mean*	*SD*	*"t" value*	*Level of Significance*
Control	30	Pre Vs. Pre	Depre-ssion	36	3.90	4.27	P<0.05 Significant
Experi-mental	30		Depression	32			

Graph No:1 (a-1) Depression

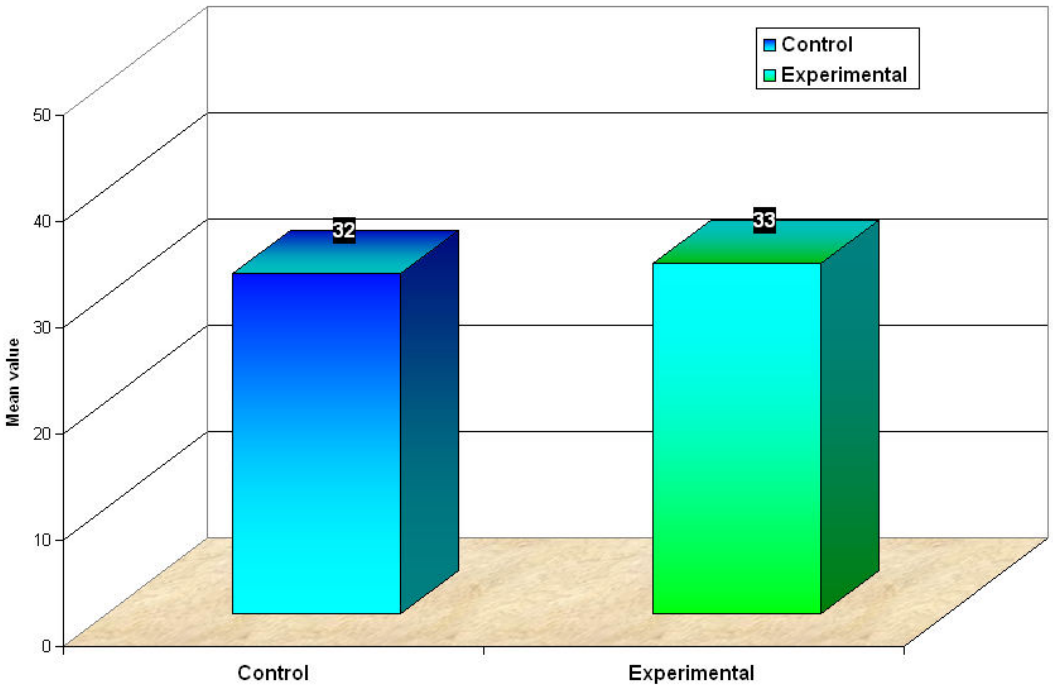


Unpaired "t" test was used to compare Pre & Pre test among control and experimental group. Table.No-1 (a) and Graph No. 1(a-1) shows that pre intervention, and significant level of depression in both control and experimental groups.

Table No: 1 (b) Anxiety

Group	*N*	*Test*	*Factors*	*Mean*	*SD*	*"t" value*	*Level of Significance*
Control	30	Pre Vs Pre	Anxiety	32	3.91	1.07	P>0.05 Not Significant
Experi-mental	30		Anxiety	33			

Graph No: 1 (b-2) Anxiety

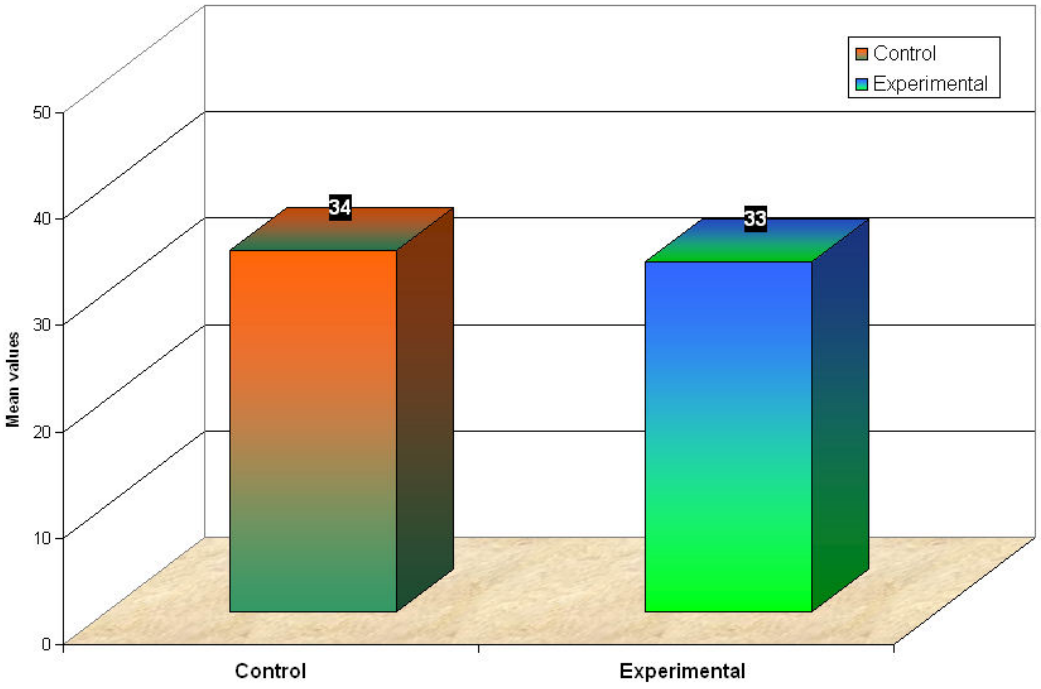


Unpaired "t" test was used to compare Pre & Pre test among control and experimental group. Table.No-1 (b) and Graph No. 1 (b-2) shows that pre intervention level of anxiety and not significant in both control and experimental groups.

Table No:1 (c) Stress

Group	*N*	*Test*	*Factors*	*Mean*	*SD*	*"t" value*	*Level of Significance*
Control	30	Pre Vs Pre	Stress	34	5.05	0.826	P>0.05 Not Significant
Experi-mental	30		Stress	33			

Graph No: 1 (c-3) Stress



Unpaired "t" test was to used compare Pre & Pre test among control and experimental group. Table.No-1 (c) and Graph No. 1 (c-3) shows that pre intervention level of stress and not significant in both control and experimental groups.

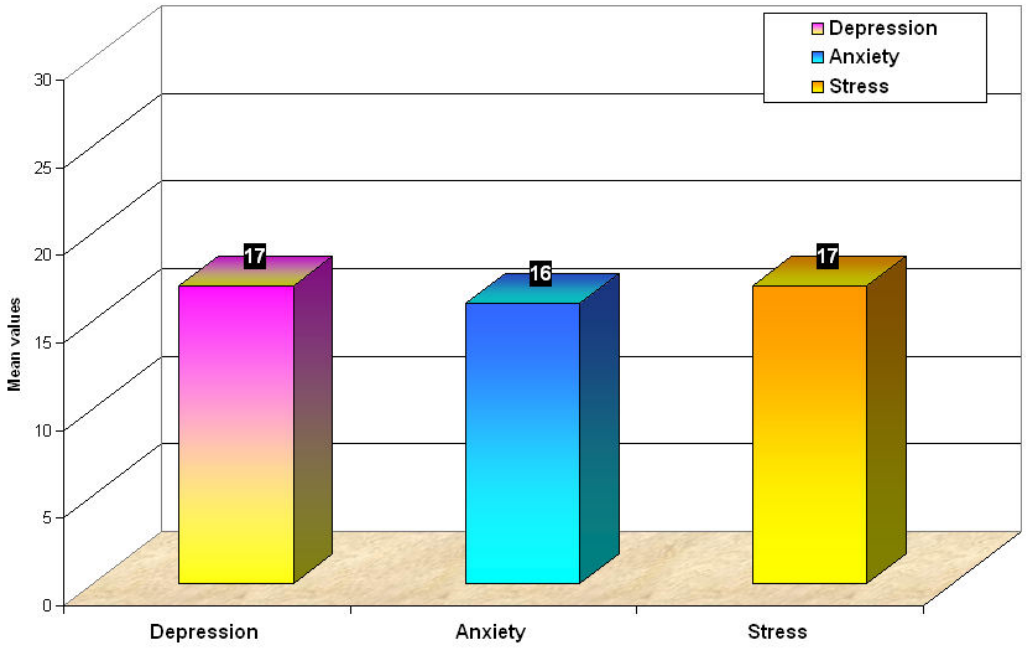
TABLE NO. 2

COMPARISON BETWEEN PRE & POST TEST AMONG EXPERIMENTAL GROUP

Table No: 2

Group	*N*	*Test*	*Factors*	*Mean*	*SD*	*"t" value*	*Level of Significance*
Experi-mental	30	Pre Vs post	Depression	17	4.4	21.25	P<0.05 Significant
			Anxiety	16	4.5	19.55	
			Stress	17	3.35	27.91	

Graph No:2 (a)



Paired 't' test was used to compare Pre & Post test among experimental group and Table No.2 and Graph No. 2 (a) shows that Pre & Post test levels of Depression, anxiety and stress in experimental group and there were significant differences of Pre & Post values.

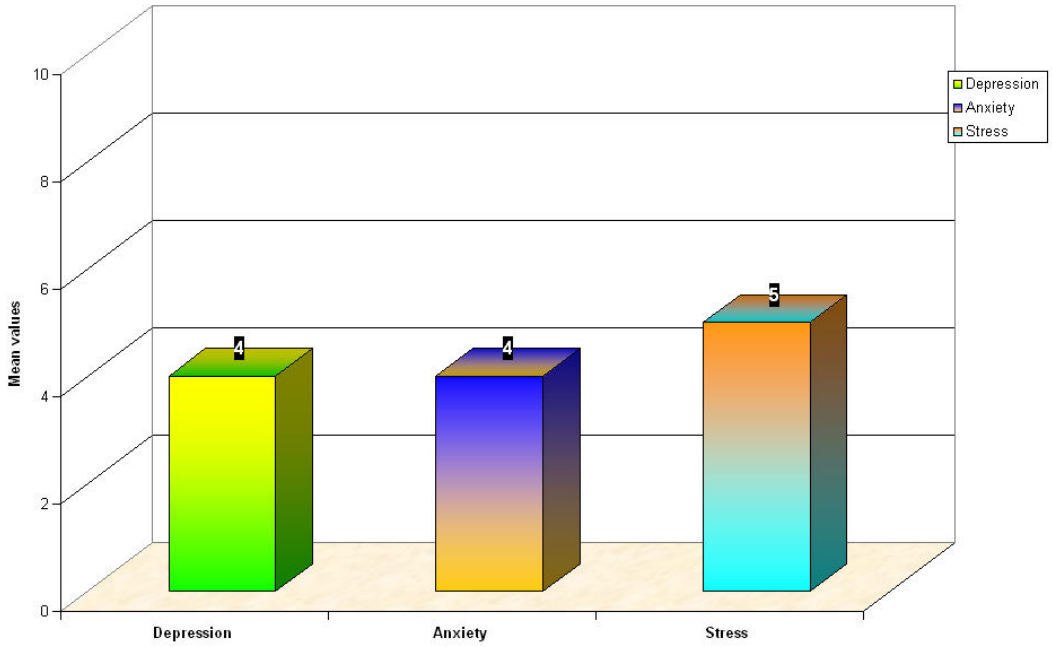
TABLE NO: 3

COMPARISON BETWEEN PRE & POST TEST AMONG CONTROL GROUP

Table No: 3

Group	*N*	*Test*	*Factors*	*Mean*	*SD*	*"t" value*	*Level of Significance*
Control	30	Pre Vs Post	Depression	4	2.03	7.55	P<0.05 Significant
			Anxiety	4	2.82	7.76	
			Stress	5	4.52	6.05	

Graph No: 3 (a)



Paired 't' test was used to compare Pre & Post test among control group and Table No.3 and Graph No. 3 (a) shows that Pre & Post test levels of Depression, anxiety and stress in control group. There were significant differences of Pre & Post values.

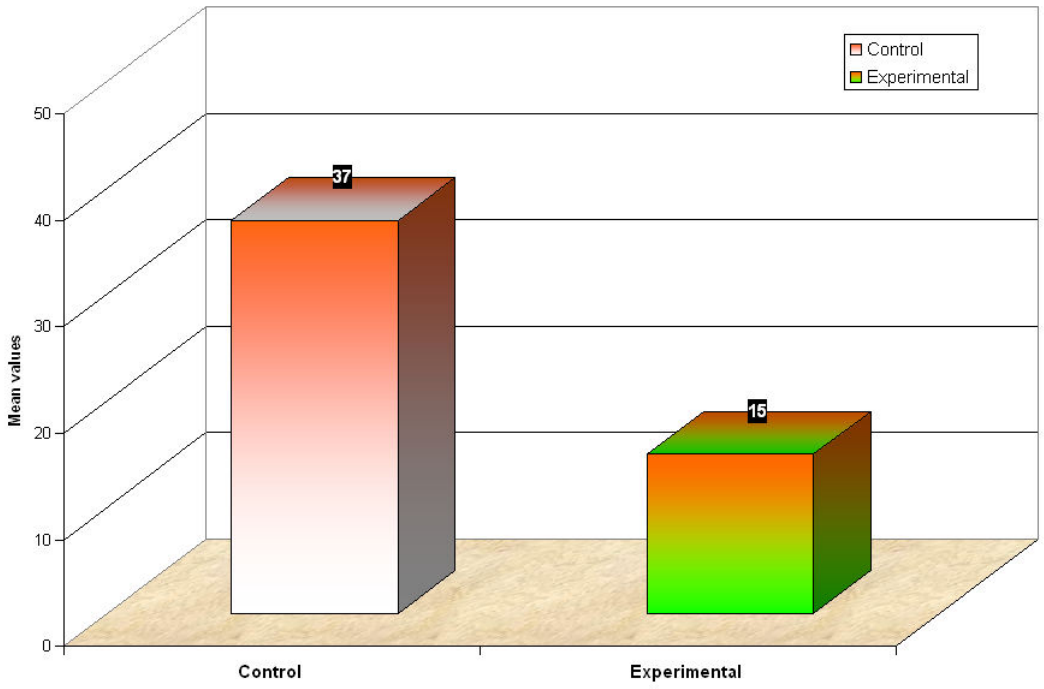
TABLE NO: 4

COMPARISON BETWEEN POST & POST TEST AMONG CONTROL AND EXPERIMENTAL GROUP

Table No: 4 (a) Depression

Group	*N*	*Test*	*Factors*	*Mean*	*SD*	*"t" value*	*Level of Significance*
Control	30	Post Vs Post	Depression	37	3.24	27.5	P<0.05 Significant
Experi-mental	30		Depression	15			

Graph No:4 (a-1) Depression

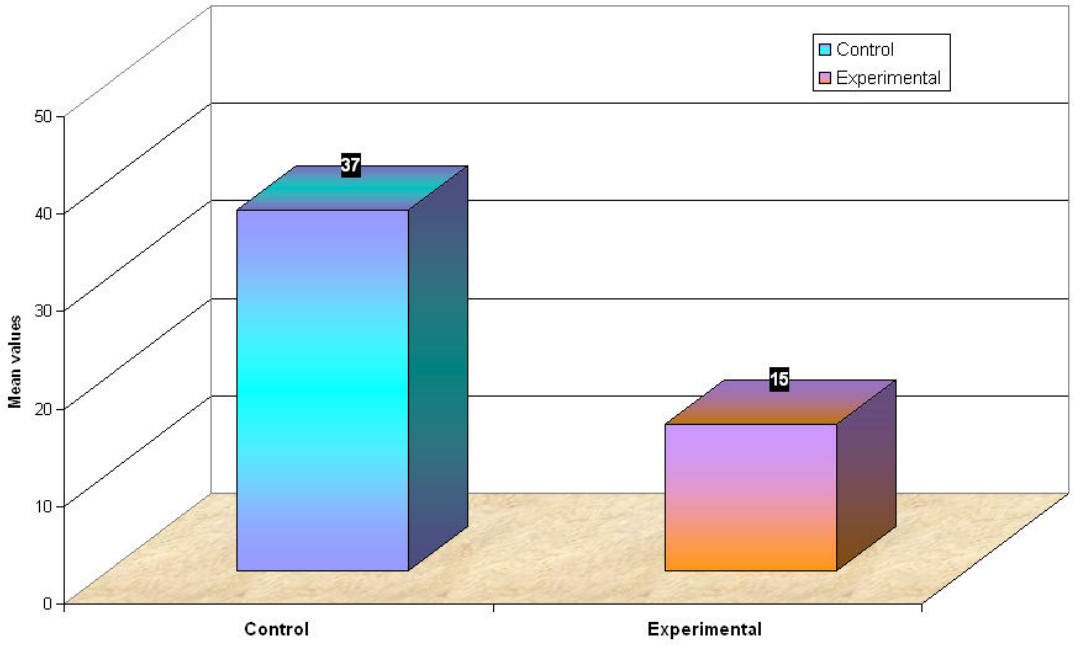


Unpaired "t" test was used to compare Post & Post test among control and experimental group. Table.No-4 (a) and Graph No. 4 (a-1) shows that Post & Post levels of depression in both control and experimental groups. There were significance differences among both groups.

Table No:4 (b) Anxiety

Group	*N*	*Test*	*Factors*	*Mean*	*SD*	*"t" value*	*Level of Significance*
Control	30	Post Vs Post	Anxiety	37	3.17	28.9	P<0.05 Significant
Experi-mental	30		Anxiety	15			

Graph No: 4 (b-2) Anxiety

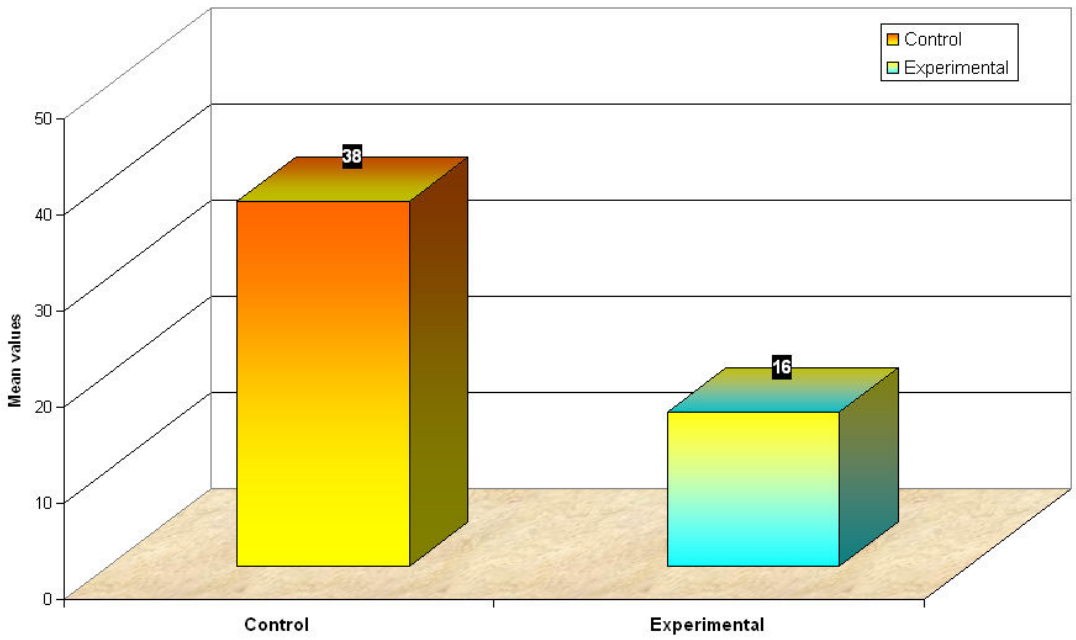


Unpaired "t" test was used to compare Post & Post test among control and experimental group. Table.No-4 (b) and Graph No. 4 (b-2) shows that Post & Post levels of anxiety in both control and experimental groups. There were significance differences among both groups.

Table No: 4 (c) Stress

Group	*N*	*Test*	*Factors*	*Mean*	*SD*	*"t" value*	*Level of Significance*
Control	30	Post Vs Post	Stress	38	3.92	24.4	P<0.05 Significant
Experi-mental	30		Stress	16			

Graph No: 4 (c-3) Stress



Unpaired "t" test was used to compare Post & Post test among control and experimental group. Table.No-4 (c) and Graph No. 4 (c-3) shows that Post & Post levels of stress in both control and experimental groups. There were significance differences among both groups.

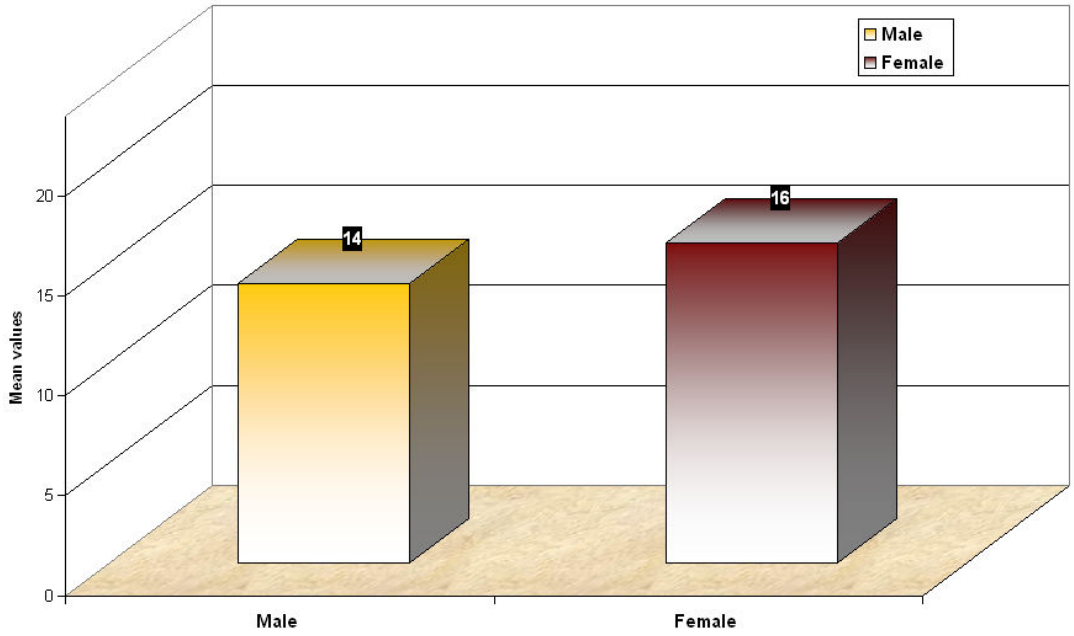
TABLE NO: 5

COMPARISON BETWEEN POST & POST TEST AMONG MALE AND FEMALE IN EXPERIMENTAL GROUP

Table No: 5 (a) Depression

Group	*N*	*Test*	*Factors*	*Mean*	*SD*	*"t" value*	*Level of Significance*
Male	15	Post Vs Post	Depression	14	2.64	2.22	P>0.05 Not Significant
Female	15		Depression	16			

Graph No: 5 (a-1) Depression

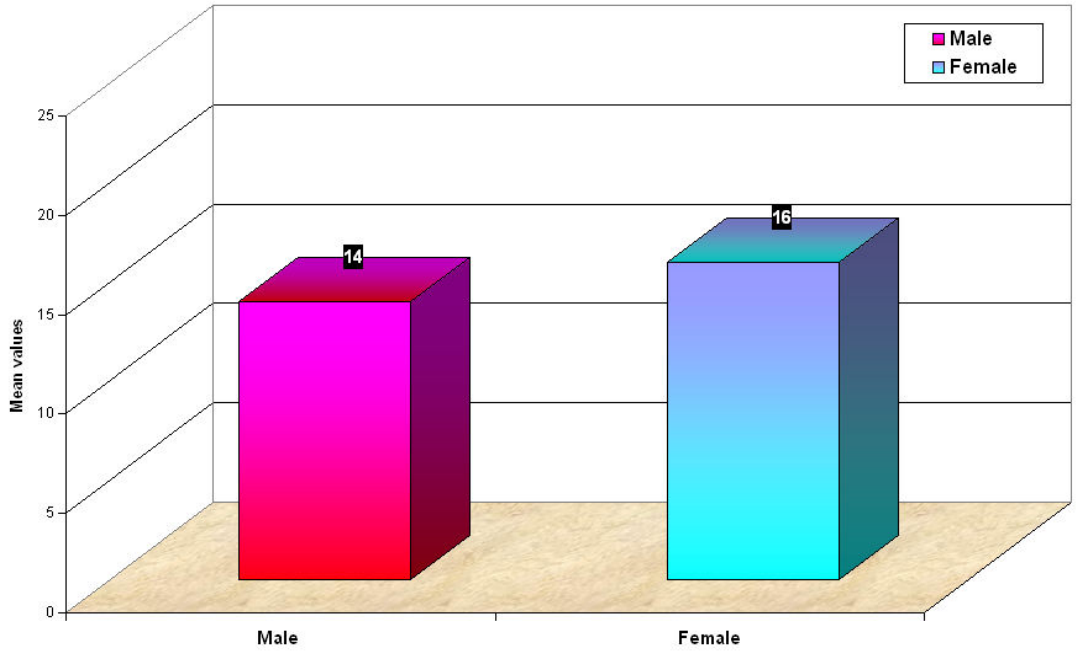


Unpaired "t" test was used compare Post & Post test among Male and Female in experimental group. Table.No-5 (a) and Graph No. 5 (a-1) shows that the Post & Post test levels and not significant in depressions of male and female in experimental groups.

Table No: 5 (b) Anxiety

Group	*N*	*Test*	*Factors*	*Mean*	*SD*	*"t" value*	*Level of Significance*
Male	15	Post Vs Post	Anxiety	14	3.16	1.86	P>0.05 Not Significant
Female	15		Anxiety	16			

Graph No : 5 (b-2) Anxiety

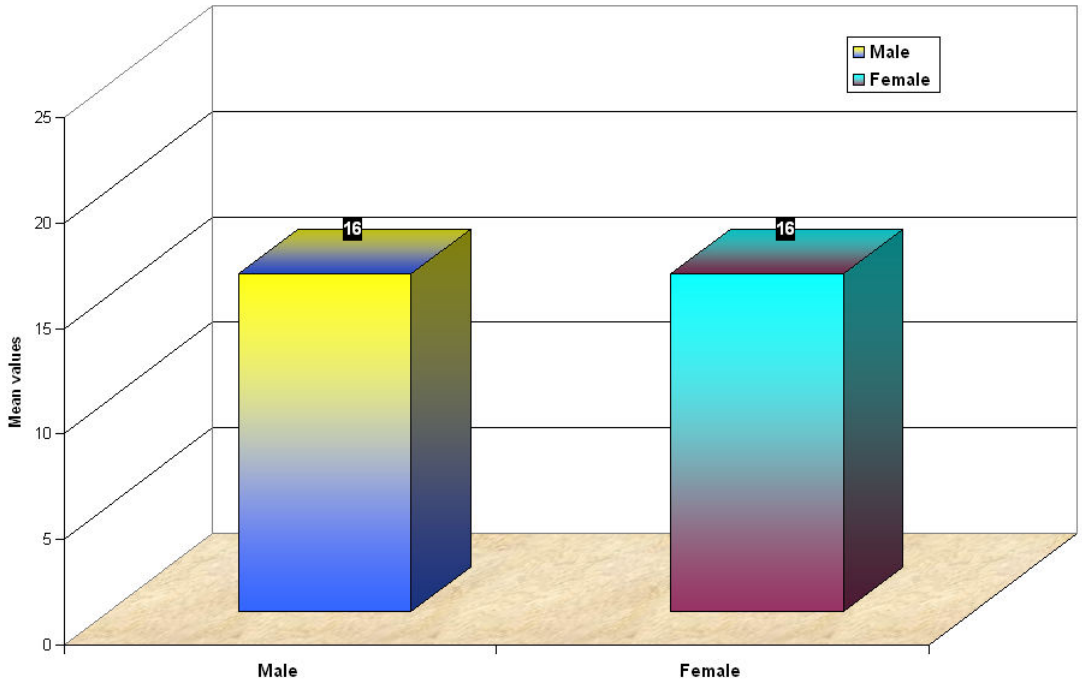


Unpaired "t" test was used to pare Post & Post test among Male and Female in experimental group. Table.No-5 (b) and Graph No. 5 (b-2) shows that the Post & Post test levels and not significant in anxiety of male & female in experimental groups.

Table No: 5 (c) Stress

Group	*N*	*Test*	*Factors*	*Mean*	*SD*	*"t" value*	*Level of Significance*
Male	15	Post Vs Post	Stress	16	3.63	0	P>0.05 Not Significant
Female	15		Stress	16			

Graph No : 5 (C-3) Stress



Unpaired "t" test was used compare Post & Post test among Male and Female in experimental group. Table.No-5 (c) and Graph No. 5 (c-3) shows that the Post & Post test levels of stress of male & females in experimental groups. There were no significant differences among them.

DISCUSSION

Diabetes is one of the mostly deadly, disabling and costly diseases facing the nation at this time. An apparent epidemic of diabetes, which is strongly related to lifestyle and economic change. Over the next decade the projected number will exceed 200 million (W.H.O). The most important demographic change to diabetes prevalence across the world appears to be the increase in the proportion of people less than 65 years of age. Zargar et al., (1999) have reported diabetics cause death and secondary complications.

A total of 60 diabetic patients were identified and conveniently allocated to the experimental and control groups. The depression, anxiety and stress levels of both groups were evaluated through $DASS_{21}$. The experimental group alone went cognitive behavioural therapy intervention for a period of four months. The post evaluation was done and the results were analyzed.

The first objective of the study was to evaluate the depression, anxiety, and stress levels of both experimental and control groups using $DASS_{21}$. Table 1 (a), (b), (c), and graphs 1 (a-1),(b-2), (c-3)shows that the levels of pre intervention. K. Nieuvenhuijsen et al., detecting anxiety & stress levels of evaluate mental health problems and calculating positive and negative test results of DASS (Depression, anxiety & stress levels) to employees.

The second objective of the study was to intervene the Experimental group with effective cognitive behavioural therapy modalities. The table No-4 (a,b,c) and Graph No: 4-(a-1), (b-2), (c-3)shows that group received intervention had statistically significant improvement ($P<0.05$) and reduction of stress among them. This study proved that the alternative hypothesis were accepted. J.L. Henry, Wiston (1997) studied 19 subjects with diabetes and intervene with cognitive behavioral therapy consisted of six weekly 1.5 hours sessions conducted in the small groups by one therapist and results indicated that the therapy had significant effects in the amelioration of anxiety and stress. Its encouraging and suggest a useful role for stress management in the maintenance of good diabetic control. Curijpers P, Roosendaal intervened unipolar depression with Bibliotherapy. A new kind of this therapy usually uses a cognitive behavioral approach. The patient takes a standardized treatment at home, in book form and works it thought independently. It also supports the second objective.

The third objective of the study was to find out the differences between experimental and control groups. The table no: 2 and graph no 2 (a), indicates pre and post test among experimental group and shows that statistically significant differences ($P<0.05$) in depression, anxiety and stress who received the effective intervention. Table.No:3 and graph No: 3 (a) indicates the pre and post test among control group and shows that significance differences ($P<0.05$) in depression, anxiety and stress who were not receive the intervention and because of extraneous variables (patients in regular medications).

Mendes D.D and Mello M.F, reviewed on effectiveness of cognitive behavioral therapy for stress disorder and 23 clinical trials included in the review comprised 1923 patients, 898 in experimental group and 1025 in the control group. The experimental group who receive the cognitive behavioral therapy and the control group was not received form of therapy. The findings shows that the specific therapies like cognitive behavioral therapy were equally effective in experimental groups.

The fourth objective of the study was to compare the effect of cognitive behavioral therapy between male and female diabetics. The Table No: 5 a,b, and graph No: 5 (a-1), (b-2) shows that there were no significant differences in male and female in depression and anxiety. Males were shows, decrease depression and anxiety after intervention comparing females. The table 5-c and graph 5 (c-3). Shows, there were no significant differences in the reduction of male and female and they were shows equal reduction of stress after intervention.

Yolanda Cate, Shelley Sikes Baker, Mary part Gilbert (Oct-1995 AJOT), stated that the Occupational therapist may be unsure of appropriate treatment approaches for diabetes also therapist consider their own knowledge base in the treatment of diabetes. These findings support to a reduction of stress among diabetes after effective cognitive behavioral therapy.

CONCLUSION

People with diabetes have to face the challenge of carrying our a range of self-care task on a day-to-today basis without compromising a normal flexible lifestyle and their sense of well-being. Still, some people with diabetes find it harder than others to live with and actively manage their conditions. These individual differences may be due to personal as well as situational barriers. Diabetes with stress, anxiety and depression in a very high rate of recurrent episodes and may lead secondary complications also even death.

Occupational therapy intervention-cognitive behavioral therapy (CBT) is the effective and comprehensive treatment to reduce stress among diabetes. This intervention could be adapted by occupational therapist to suit the needs of people who suffer from diabetes.

LIMITATIONS

- The study was limited to smaller samples.
- The study was limited to 40-60 years.
- The study was limited to diabetic type 2 patients.
- The study was limited to non-complicated diabetic patients only.

RECOMMENDATIONS

- The study may be undertaken with largest samples.
- The study may be included above 60 age groups.
- The study can be done with diabetic type 1 patients.
- The study can be done with diabetic secondary complicated patients also.
- The study can be done with other conventional therapies like Yoga, Music therapy etc.

REFERENCES

1. Anne Cronin Mosey- "**Psychosocial components of occupational therapy"**.

2. Annelid Sepia, Johny Ludvigson., "Psychological stress and risk of diabetes related auto-immunity", Journal of Neuro Immuno modulation, Feb, 2006, Vol-13, Page 5-6.

3. Cathy Lloyd, "The effects of diabetes on depression", Diabetes voice, March 2008, Vol, 53 (1).

4. Charles H. Christiansen, Carolyn. M. Baum, "**Occupational therapy-performance, participation and well being**".

5. Clifford T. Morgan, Richard A. King, John R. Weisz, John Schopcer, "**Introduction to Psychology**", 7th edition.

6. Davidson, "**Principles and Practice of Medicine**", 7th edition.

7. Hary Timmermans, "**Models of activity scheduling behavior**", 1989.

8. Henry Julie.D, Crawford John, "Depression anxiety stress scales in normative data latent structure in a large non-clinical samples", British Journal of clinical psychology, 2003, Vol.42, Page 111-131.

9. Henry. J.L., Wilson, Cognitive stress management for patients with diabetes-psychology", Health and medicine, 1997.

10. Jane Case Smith Ed.D., OTR/L, "Relationship among physiology, stress, Behavior and the environment", Occupational therapy Journal Research, OTJR, Vol-29, 2009.

11. Jennifer Creek, "**Occupational therapy and Mental Health-Principles, skills and practice**".

12. Jennifer Greek and Anne Lawson Porter, "**Contemporary Issues in Occupational therapy (Reasoning & Reflection)"**.

13. John.B. Arden and Lloyd. Linford, "**Brain Based therapy with adults –evidence based treatment for everyday practice**".

14. Laura Shea and Michele, "Diabetes and depression on older women", Diabetes Voice, May 2009, Volume 54, Special issue.

15. Mark. A. Reinecke, Frank M. Dattilio, Arthur Freeman, "**Cognitive therapy with children and adolescents**", 2nd edition.

16. Mary Ann Giroux Bruce, Barbara Borg, "**Psychosocial frames of references-core for occupation-based practice**", 3rd edition.

17. Mary Beth Early, "**Mental Health Concepts and techniques for the occupational therapy assistants**".

18. Moya Wilson, "**Occupational therapy in short-term psychiatry**" 3rd Edition.

19. Nicole Van Derven, Katie Weinger and Frank Snoek, "Cognitive behavioral therapy for diabetes". Diabetes Voice, September, 2002, Vol- 47, Issue 3.

20. Peter J. Norton, "Depression, Anxiety and stress scale- (DASS-21)" Psychometric analysis - anxiety, stress and coping, Vol. 20, Issue 3, Sep 2007.

21. Ruth Wright, Leonie Sugarman, "Occupational Therapy and Life course development", A work Book for professional practice in health and social care, 2009, 1st Edition.

22. Sanjay Kalra, Bharti Kalra, Naresh Kumar, "**Prevention and management of diabetes-diabetes**" Voice / Sep 2007, Vol. 52, Issue 3.

23. Sarah Wild, Gojka Raglic, Andres Green, "**Diabetes Care**", Volume, 27.

24. Sharon.L. Johnson, "**Therapist Guide to clinical intervention, The 1,2,3's of Treatment Planning**", 2nd edition.

25. Yolanda Cate, Shelley Sikes Baker, Mary Pat Gilbert, "Occupational therapy and the person with diabetic and vision impairment", American Journal of Occupational Therapy (AJOT), Oct 1995, Vol-49.

APPENDIX

DEPRESSION, ANXIETY, STRESS SCALE (DASS-21)

DASS21	***Name:***	***Date:***			
Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement. *The rating scale is as follows:* 0 Did not apply to me at all 1 Applied to me to some degree, or some of the time 2 Applied to me to a considerable degree, or a good part of time 3 Applied to me very much, or most of the time					
1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (eg, in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3

SCORING TEMPLATE

DASS	SCORING TEMPLATE
	S
	A
	D
	A
	D
	S
	A
	S
	A
	D
	S
	S
	D
	S
	A
	D
	D
	S
	A
	A
	D

Apply template to both sides of sheet and sum scores for each scale.

For short (21-item) version, multiply sum by 2.

ACTIVITY SCHEDULING

Name : Age / Sex:

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Patient Sign.	Therapist Sign.
6-7									
7-8									
8-9									
9-10									
10-11									
11-12									
12-1									
1-2									
2-3									
3-4									
4-5									
5-6									
6-7									
7-8									
8-9									
9pm-6am									

MASTER CHART (DEPRESSION, ANXIETY & STRESS SCORES OF BOTH EXPERIMENTAL AND CONTROL GROUP)

S.NO	EXPERIMENTAL GROUP						CONTROL GROUP					
	Depression		Anxiety		Stress		Depression		Anxiety		Stress	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
1	34	14	38	10	38	18	38	32	32	42	38	44
2	32	14	34	14	36	16	38	38	36	40	32	36
3	38	14	34	16	36	14	30	24	26	28	18	24
4	30	14	36	14	40	18	40	36	36	34	36	38
5	38	14	34	16	36	18	36	40	32	34	36	34
6	26	16	26	10	30	06	32	36	30	36	34	38
7	30	06	28	12	32	14	34	36	32	40	36	42
8	44	16	34	16	32	14	38	38	34	40	24	46
9	28	16	28	16	36	14	42	40	34	34	36	42
10	34	14	30	16	30	18	38	42	36	40	26	38
11	26	14	36	12	30	16	30	40	36	36	40	40
12	30	14	26	16	28	14	42	38	32	34	42	42
13	32	14	28	14	32	16	36	30	38	38	32	42
14	32	14	30	12	38	20	32	34	34	36	40	36
15	32	14	28	20	36	22	34	40	32	30	38	42

S.NO	EXPERIMENTAL GROUP						CONTROL GROUP					
	Depression		Anxiety		Stress		Depression		Anxiety		Stress	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
16	32	16	30	14	32	18	38	40	34	40	36	38
17	28	12	22	12	24	12	36	36	32	36	36	40
18	30	16	26	14	32	18	32	38	32	38	24	36
19	28	18	28	16	34	18	32	36	32	36	36	38
20	24	14	24	14	24	10	34	38	30	40	36	34
21	30	14	38	18	32	16	34	38	38	40	40	42
22	32	16	30	12	26	08	28	38	34	38	30	30
23	34	22	34	16	30	20	38	38	34	34	32	34
24	30	14	28	12	34	16	38	38	38	36	38	42
25	34	16	32	14	36	18	38	40	28	36	42	38
26	34	14	34	16	34	14	40	36	26	36	38	40
27	34	14	30	18	34	16	34	36	38	40	34	36
28	38	22	36	22	32	18	38	34	28	38	28	42
29	30	22	34	24	38	22	34	34	38	40	36	38
30	32	14	28	14	34	18	34	40	32	34	38	38

MASTER CHART (DEPRESSION, ANXIETY & STRESS SCORES OF MALE AND FEMALE DIABETICS IN EXPERIMENTAL GROUP)

S.NO	MALES						FEMALES					
	Depression		Anxiety		Stress		Depression		Anxiety		Stress	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
1	34	14	38	10	38	18	32	16	30	14	32	18
2	32	14	34	14	36	16	28	12	22	12	24	12
3	38	14	34	16	36	14	30	16	26	14	32	18
4	30	14	36	14	40	18	28	18	28	16	34	18
5	38	14	34	16	36	18	24	14	24	14	24	10
6	26	16	26	10	30	06	30	14	38	18	32	16
7	30	06	28	12	32	14	32	16	30	12	26	08
8	44	16	34	16	32	14	34	22	34	16	30	20
9	28	16	28	16	36	14	30	14	28	12	34	16
10	34	14	30	16	30	18	34	16	32	14	36	18
11	26	14	36	12	30	16	34	14	34	16	34	14
12	30	14	26	16	28	14	34	14	30	18	34	16
13	32	14	28	14	32	16	38	22	36	22	32	18
14	32	14	30	12	38	20	30	22	34	24	38	22
15	32	14	28	20	36	22	32	14	28	14	34	18

Ph : 0091 - 04288 - 260032, 260588

J.K.K.MUNIRAJAHH MEDICAL RESEARCH FOUNDATION
COLLEGE OF OCCUPATIONAL THERAPY

Ethirmedu, B.Komarapalayam - 638 183. Namakkal Dist, Tamilnadu, India.
Wedsite : www.jkkm.org, e-mail : jkkm_kpm@yahoo.com

Rtn. MPHF. **Dr. J.K.K. MUNIRAJAHH** M.Tech., (Bolton)
Correspondent

Mr. T.JEGADEESAN M.O.T., M.Sc.(Psy).,
Principal

Ref: MOT/DIS/09-10/11-D

Date : *23.11.2009*

The Director,
Dr. Jeyasekaran Medical Trust,
Dr. Jeyasekaran Hospital & Nursing Home,
K.P.Road,
NAGERCOIL,
Kanyakumari District.

Sir/Madam,

The bearer of this letter Mr. J.P. VINITH DANI JOSE is a Bonafide student of our College of Occupational Therapy, doing his second year (Final year) in the Master of Occupational Therapy Post Graduate Degree Course.

As part of his studies he is doing his project work on "EFFECTIVENESS OF COGNITIVE BEHAVIORAL THERAPY INTERVENTION IN THE REDUCTION OF STRESS AMONG DIABETICS".

Related to his Project he wants to collect some data from your institution.

I will be thankful if you could kindly provide him the data so that he can complete his Project.

Thanking you,

Yours faithfully,

T. Jegadeesan
PRINCIPAL
JKKMMRF COLLEGE OF
OCCUPATIONAL THERAPY
KOMARAPALAYAM - 638 183

JKKMMRF COLLEGE OF OCCUPATIONAL THERAPY KOMARAPALAYAM DT. JKKMMRF

On & Permit

Dr. D. DEVAPRASATH JEYASEKHARAN
Trustee
Dr. JEYASEKHARAN MEDICAL TRUST

DR. JEYASEKHARAN MEDICAL TRUST DR. JEYASEKHARAN HOSPITAL & NURSING HOME K. P. ROAD NAGERCOIL-2